U.S. EPA Water Security Initiative

Water Security Initiative Overview

The Water Security (WS) initiative is a U.S. Environmental Protection Agency (EPA) program that addresses the risk of intentional contamination of drinking water distribution systems. EPA established this initiative in response to Homeland Security Presidential Directive 9, under which the Agency must "*develop robust, comprehensive, and fully coordinated surveillance and monitoring systems, including international information, for…water quality that provides early detection and awareness of disease, pest, or poisonous agents.*"

EPA is implementing the WS initiative in three phases: (Phase I) develop the conceptual design of a system for timely detection and appropriate response to drinking water contamination incidents to mitigate public health and economic impacts; (Phase II) test and demonstrate contamination warning systems through pilots at drinking water utilities and municipalities and make refinements to the design as needed based upon pilot results; and (Phase III) develop practical guidance and outreach to promote voluntary national adoption of effective and sustainable drinking water contamination warning systems. Each of these phases is further described below.

Phase 1 – Conceptual Design

The design of the WS initiative's contamination warning system involves the deployment of multiple monitoring and surveillance components to achieve timely detection of possible contamination in drinking water distribution systems. The use of multiple components is expected to attain overall faster detection of a broader range of potential contaminants than reliance on a single technology. Further, the WS components were chosen to be sustainable for long-term operation and to provide "dual-use" benefits to drinking water utilities, such as improved water quality management. The WS contamination warning system components are as follows:

- ***Online water quality monitoring*** comprises stations located throughout the distribution system that measure chlorine, total organic carbon, conductivity, and other parameters. Software analyzes the monitoring data to establish baseline parameter levels. Possible contamination is indicated when a significant deviation from a baseline occurs.

- ***Public health surveillance*** involves the analysis of health-related data to identify disease events that may stem from drinking water contamination. Public health data may include over the counter drug sales, hospital admission reports, infectious disease surveillance, EMS reports, 911 calls, and poison control center calls.

- ***Sampling and analysis*** is the collection of distribution system samples that are analyzed for classes of contaminants, as well as specific contaminants. Sampling is both routine, to establish a baseline, and triggered, to respond to an indication of possible contamination from another component. Analyses are conducted for chemicals, radionuclides, pathogens, and toxins using a laboratory network.

- ***Enhanced security monitoring*** includes the equipment and procedures that detect and respond to security breaches at distribution system facilities. Security equipment may be cameras, motion sensing lights, door contacts, ladder and window motion detectors, and access hatch detectors.

- ***Consumer complaint surveillance*** enhances the collection and automates the analysis of calls by consumers for water quality problems indicative of possible contamination. Consumers may detect contaminants with characteristics that impart an odor, taste, or visual change to the drinking water.

Another key aspect of the WS contamination warning system design is the development of a consequence management plan. This plan is intended to guide the utility through the process of determining whether a possible contamination event, as indicated by one of the WS surveillance components, is credible and can be

confirmed. It also assists the utility in working with local partners, communicating with the public, and determining appropriate response-actions. In the event of actual contamination, the plan provides information on remediation and recovery steps to return the utility to normal operation.

Phase 2 – Pilots at Drinking Water Utilities

EPA is currently implementing the first WS contamination warning system pilot in partnership with the City of Cincinnati at the Greater Cincinnati Water Works (GCWW). This pilot consists of all five monitoring and surveillance components and a consequence management plan as described above. Implementation of this pilot began in June 2006, and deployment of the pilot components was completed in July 2007. The next stages of this pilot include full operation and evaluation.

In April 2008, the Agency will award funding for contamination warning system pilots in New York City and another city to be publicly announced shortly. Further, two additional cities have been selected for pilots and are expected to be funded when the award process is completed. New York City and the three additional pilots were selected through a national competition. They will be three year projects carried out as cooperative agreements with the Agency.

These pilots will provide information on many facets of the WS contamination warning system, such as the performance of monitoring and surveillance components; approaches for reducing false alarms; effective consequence management planning; costs and benefits, including dual-use applications and sustainability; and efficient approaches to design and implementation.

Phase 3 – Guidance and Outreach

EPA is developing guidance documents from the WS initiative in interim and final versions. This approach will allow dissemination of information from the WS initiative to stakeholders who are involved in contamination warning system activities in the near term, while also providing the opportunity for incorporating lessons learned from the pilots to enhance and refine the guidance. The following are WS guidance documents that EPA intends to release through 2008:

- ***Interim Guidance on Planning for Contamination Warning System Deployment*** **(May 2007)** will assist drinking water utilities in planning for contamination warning system deployment based on the WS initiative model.

- ***WS Interim Consequence Management Plan Guidance*** **(Summer 2008)** will assist drinking water utilities in the development and implementation of a utility-specific consequence management plan for an existing or emerging contamination warning system.

- ***WS Interim Operational Strategy Guidance*** **(Summer 2008)** will describe the process and procedures involved in routine operation of a contamination warning system, including process and information flows, roles and responsibilities, and the initial investigation and validation of alarms.

In addition to these documents, EPA intends to release technical findings, reports, and tools from the WS initiative as they become available.

Resources for Additional Information on the Water Security Initiative

For questions or comments on the WS initiative, see http://cfpub.epa.gov/safewater/watersecurity/initiative.cfm or contact Dan Schmelling, WS Project Coordinator, at 202-564-5281 (Schmelling.dan@epa.gov).